REMARKS BY PRESIDENT WAYNE CLOUGH
Distinguished Professor Award Presentation
Faculty/Staff Honors Luncheon, April 9, 2003

I want to echo the words of appreciation to the classes of 1940 and 1934. Georgia Tech has a superb and hard-working faculty, and these two classes have provided us with the means to honor and reward outstanding performances by our faculty.

With so many outstanding faculty to choose from, narrowing the field down to one person to receive Georgia Tech's highest faculty honor is always a difficult task. But each year the committee somehow manages to come up with just the right person to recommend for the Distinguished Professor Award. And this year is certainly no exception.

This year's award recipient is a researcher's researcher, whose ground-breaking work in emerging new semiconductor materials helps to steer other researchers in the right direction. Semiconductors are presently based on silicon, but as the technology moves forward, microcircuits keep getting smaller and their electric field strength keeps getting higher. As a result, there are a growing number of new applications for which silicon does not work well. Examples include the next generation of high-frequency, high-power amplifiers at wireless telecommunications base stations, the high-temperature electronics in the next generation of aircraft and automotive engines, and circuitry for the high-radiation environments of space.

Nanoscientists are developing new materials like gallium nitride and silicon carbide that have the potential to replace silicon in applications like these. However, before device designers put these new materials to work, they need to know how they will behave and what their limitations are. To find out, they ask Dr. Kevin Brennan, Byers Professor of Electrical and Computer Engineering. He has worked with colleagues at the University of Minnesota to develop a unique theoretical technique called "materials theory-based modeling" to determine how these new materials will perform and how a device made of them will behave.

Predicting is often a risky business, even when you have a lot of technology to help you out. But Dr. Brennan is much more reliable than, say, a weather forecaster. His predictions about how gallium nitride and silicon carbide would behave at very high applied voltages have been confirmed by experimental measurements. This ability to predict how new, unconventional materials will perform helps to steer device designers in the right direction, helping them design and build devices with the best possible performance while holding down the cost of development.

It is no surprise that exciting research like this attracts students like honey attracts flies. And Dr. Brennan has not only supervised a long list of post-doctoral fellows and visiting scientists, but also an even longer list of graduate students at both the PhD and master's degree level. Over the years he has served on some 60 PhD committees, including a few

in the School of Physics as well as his home School of Electrical and Computer Engineering.

He has served on the ECE Committee on Graduate Student Recruitment for a number of years, and chaired the committee from 2000 through 2002. He has also developed several new graduate courses along the way, and he helped to revise the ECE curriculum in response to the conversion from quarters to semesters.

Dr. Brennan has been involving undergraduates in his research work for many years. In fact, the very first undergraduate he supervised way back in 1985 was a promising young senior named Gary May, who is now a fellow professor in the School of Computer and Electrical Engineering and my executive assistant.

Dr. Brennan has been at Georgia Tech for almost 20 years. He received his bachelor's degree in physics from M.I.T., then completed a master's degree in physics and a PhD in electrical engineering at the University of Illinois at Urbana-Champaign. He has published over 135 papers in scientific peer reviewed journals, and he holds seven patents.

In recent years, he has focused on writing books. His first book, *Physics of Semiconductors with Applications to Optoelectronic Devices*, was published in 1999 and his latest book, *Introduction to Semiconductor Devices for Computing and Telecommunication Applications*, will be off the press next fall. In between these two books, he co-authored *Theory of Modern Electronic Semiconductor Devices*, which was just published last year, and he was co-editor of *Topics in High Field Transport in Semiconductors*, which was published in 2001.

Last spring he was the deserving recipient of the Vice Provost for Research Special Recognition Award for Graduate Education and Research Scholarship, and was also honored with the School of Electrical and Computer Engineering's Distinguished Professor Award.

This year we are very proud to present him with the Class of 1934 Georgia Tech Distinguished Professor Award for 2003.